Technical information for Cellulose Acetate

Measuring method

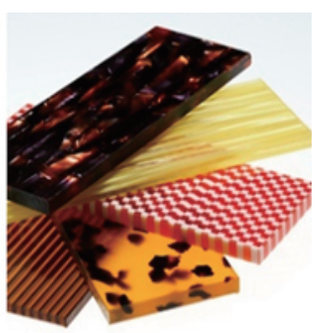
The representative testing items and those testing methods for cellulose acetate are as shown below. Please contact us from the inquiry form for details of the testing method.
Our cellulose acetate is quality controlled as general industrial raw material. It should be noted that cellulose acetate of our company is intended for raw materials for general industrial applications and is produced under a quality control as such.

Representative testing items and testing methods for cellulose acetate

Property	Test Method
Moisture	Dry sample in an oven for 2hr at 105±5°C, and weigh accurately.
Combined Acetic Acid	After extracting the acetic acid content in the sample, perform neutralization titration.
6% Viscosity	Measure the time of flow at 25°C with an Ostwald viscometer.
Boiling Water Stability	After extracting the acetic acid content in the sample with boiling water, neutralization titration is performed.
Ash content	The sample is put in a crucible, carbonized with an electric heater, and ashed in an electric furnace.

Plasticization

Cellulose acetate itself has no thermoplasticity.
The use of an appropriate plasticizer in the thermal molding can lower a softening temperature to a temperature suitable for processing. Further, the addition of a plasticizer can improve the flexibility of a molded article.
The typical plasticizers compatible with cellulose acetate are shown in the table on the right.



Plasticizers compatible with cellulose acetate

Plasticizer
Triethyl citrate
Acetyl triethyl citrate
Dibutyl phthalate (DBP)
Diaryl phthalate
Diethyl phthalate (DEP)
Dimethyl phthalate (DMP)
Di-2-methoxyethyl phthalate
Dibutyl tartrate
Ethyl o-benzoylbenzoate
Ethyl phthalyl ethyl glycolate (EPEG)
Methyl phthalyl ethyl glycolate (MPEG)
N-Ethyltoluenesulfonamide
Triacetin (from our company)
o-Cresyl p-toluenesulfonate
Triethyl phosphate (TEP)
Triphenyl phosphate (TPP)
Tripropionin

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Solvent and Solubility

The solubility of cellulose acetate in a solvent depends on the acetyl value. It excellent oil resistance, solvent resistance, and the like, however, the solvent dissolution range is narrower than other cellulose derivatives such as cellulose nitrate and ethyl cellulose, selection of the variety and solvent is a key point in using cellulose acetate. The solubility's of cellulose acetate in typical solvents are as shown below. The addition of a small amount of an auxiliary solvent such as an alcohol to a main solvent may improve the solubility.

Acetyl value and solubility in various solvents

Solvent / Acetyl value		51%	55%	61%
Ketones	Acetone	○	○	×
	Methyl ethyl ketone	×	○	×
	Cyclohexanone	○	○	×
	Diacetone alcohol	○	○	×
Esters	Methyl formate	○	○	△
	Methyl acetate (from our company)	△	○	△
	Ethyl acetate (from our company)	×	○	×
	Ethyl lactate	○	○	×
Nitrogen-containing compounds	Nitromethane	○	○	×
	Acetonitrile	○	△	×
	N-Methylpyrrolidone	○	○	○
	Dimethylformamide	○	○	△
Glycols	Methyl glycol	○	△	×
	Methyl glycol acetate	○	○	×
Ethers	Tetrahydrofuran	○	○	×
	Dioxane	○	○	△
	Dioxolane	○	○	○
Halogenated hydrocarbons	Methylene chloride	×	○	○
	Chloroform	×	○	△
	Tetrachloroethane	×	○	○
Others	Dimethyl sulfoxide	○	○	△
	Propylene carbonate	○	×	×

○: soluble △: partially soluble ×: insoluble Dissolved at room temperature 10%concentration

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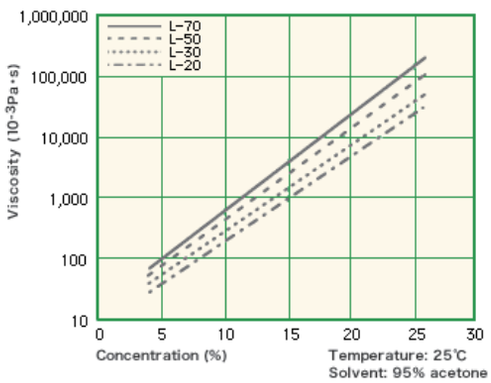
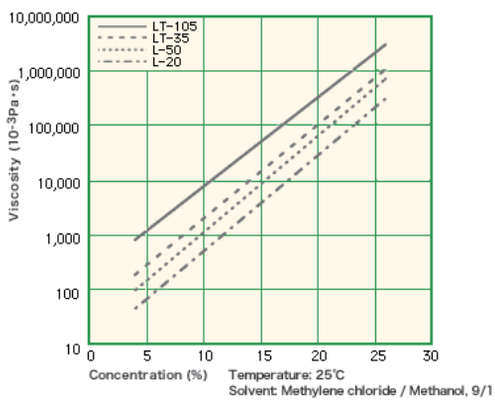
Solution viscosity

The solution viscosity of cellulose acetate varies depending on the product type (degree of polymerization), the type and concentration of the solvent. The solution viscosities of cellulose acetate in acetone-based and methylene chloride-based mixed solvents as typical examples are as shown below.

Solution viscosity of acetone and dichloromethane systems





Precautions in handling cellulose acetate

There is no report showing that cellulose acetate has toxicity. However, when handling a large amount of cellulose acetate, it is necessary to take measures against dust. See a material safety data sheet (SDS) of cellulose acetate before handling. Further, some of solvents for dissolving cellulose acetate and additives such as a plasticizer are substances harmful for the human body. Hence, the substances should be handled with care in accordance with the respective material safety data sheets (SDS).

Item	Detail
Registration number in list of existing chemical substances	8-165
CAS No.	9004-35-7
Synonym	Acetyl cellulose

Safety assessment of cellulose acetate

Cellulose acetate is made from natural cellulose and acetic acid, the main component of vinegar, and is a substance which is highly safe for living organisms.

Item	Skin irritation	Skin sensitization	Eye irritation	Carcinogenicity
BELLOCEA™	Non-irritant	Negative	Non-irritant	Negative
Cellulose diacetate				
Cellulose triacetate				
Testing method	OECD TG439 In Vitro Skin Irritation: Reconstructed Human Epidermis Test Method	OECD TG442C In Chemico Skin Sensitisation: Direct Peptide Reactivity Assay	OECD TG492 Reconstructed Human Cornea-like Epithelium Test Method	Mutagenicity test using microorganisms (Ames test)